

CLAIMS

1. A lip seal having a sealing lip adapted for sealing engagement at an end thereof with a relatively movable surface to separate a sealed region from an unsealed region, and a shield coextensive with the sealing lip on the unsealed side thereof to protect the sealing lip from the unsealed region and to define a space with the lip, and means permitting the injection under pressure of fluid into the space, the shield having an end disposed such that the fluid exits the space by passing between the lip end and the shield end into the unsealed region.
2. A lip seal according to Claim 1, wherein, during normal use, the shield contacts the sealing lip proximate the end thereof, the fluid being injected at sufficient pressure to cause the shield to flex to allow the fluid to flow towards the end of the sealing lip.
3. A lip seal according to Claim 1, wherein the sealing means comprises a first resilient member having said sealing lip and, adjacent to the first annular member, a second resilient member having said shield.
4. A lip seal according to Claim 3, wherein the first member comprises a further shield, the further shield being positioned on the sealed side of the lip.
5. A lip seal according to Claim 3, wherein the second member comprises a further lip, the further lip being positioned on a side of the shield remote from the first member.
6. A lip seal according to Claim 3, wherein the second member is formed from a reinforced elastomer.
7. A lip seal according to Claim 3, wherein the first and second members are annular.

8. A lip seal according to Claim 7, wherein the sealing means comprises an outer diameter body portion from which the lip and shield extend radially inwardly.
- 5 9. A lip seal according to Claim 8, wherein the body portion is adapted for retention within a housing of a bore for a shaft.
- 10 10. A lip seal according to Claim 1, wherein the means permitting injection is arranged to admit fluid between the shield and a grooved portion of the sealing means which defines in part the sealing lip.
- 15 11. A lip seal according to Claim 1, wherein the sealing means comprises at least one port extending through the sealing means and through which the inject fluid is injected.
- 20 12. A lip seal according to Claim 7, wherein the means permitting injection is arranged to admit fluid between the shield and a grooved portion of the sealing means which defines in part the sealing lip, and the at least one port extends between the first and second annular members.
- 25 13. A lip seal comprising resilient sealing means having a sealing lip adapted for sealing engagement at an end thereof with a relatively movable surface, a shield lip, the sealing and shield lips being normally closed together, and means permitting injection of fluid between the closed lips at sufficient pressure to cause the lips to open during use to allow the fluid to flow towards the end of the sealing lip.
- 30 14. A seal assembly comprising at least one lip seal according to Claim 1, disposed between relatively movable parts to define a sealed and an unsealed region.
15. A seal assembly according to Claim 14, wherein the relatively movable parts are substantially coaxial and are relatively movable by rotation and/or

translation about or along said axis.

16. A seal assembly according to Claim 15, comprising a plurality of lip seals according to Claim 1 axially spaced along the axis of the relatively movable parts.
17. An element for use in a lip seal comprising:
a body portion;
a sealing lip depending from the body portion, the sealing lip being adapted for sealing engagement at an end thereof with a relatively movable surface to separate a sealed region from an unsealed region; and
a shield depending from the body portion, the shield being coextensive with the sealing lip and being disposed on the sealed side of the sealing lip, the element being configured to abut a further said element so that the shield provides, with the lip of the further element, a lip seal according to Claim 1.
18. Use of a pressurized flow of fluid directed along an external surface of a sealing lip according to Claim 1, towards an end thereof in sealing engagement with a relatively moving surface (as herein defined) to remove debris accumulated at the end of the sealing lip.
19. A method of protecting a lip seal from contamination, the lip seal comprising resilient sealing means having a sealing lip adapted for sealing engagement at an end thereof with a relatively moving surface, the method comprising providing a shield coextensive with the sealing lip, the shield allowing fluid injected into a space between the lip and the shield to exit the space by passing between the lip end and an end of the shield.
20. The method of Claim 19 wherein the shield restricts material from crossing the shield end into the space.